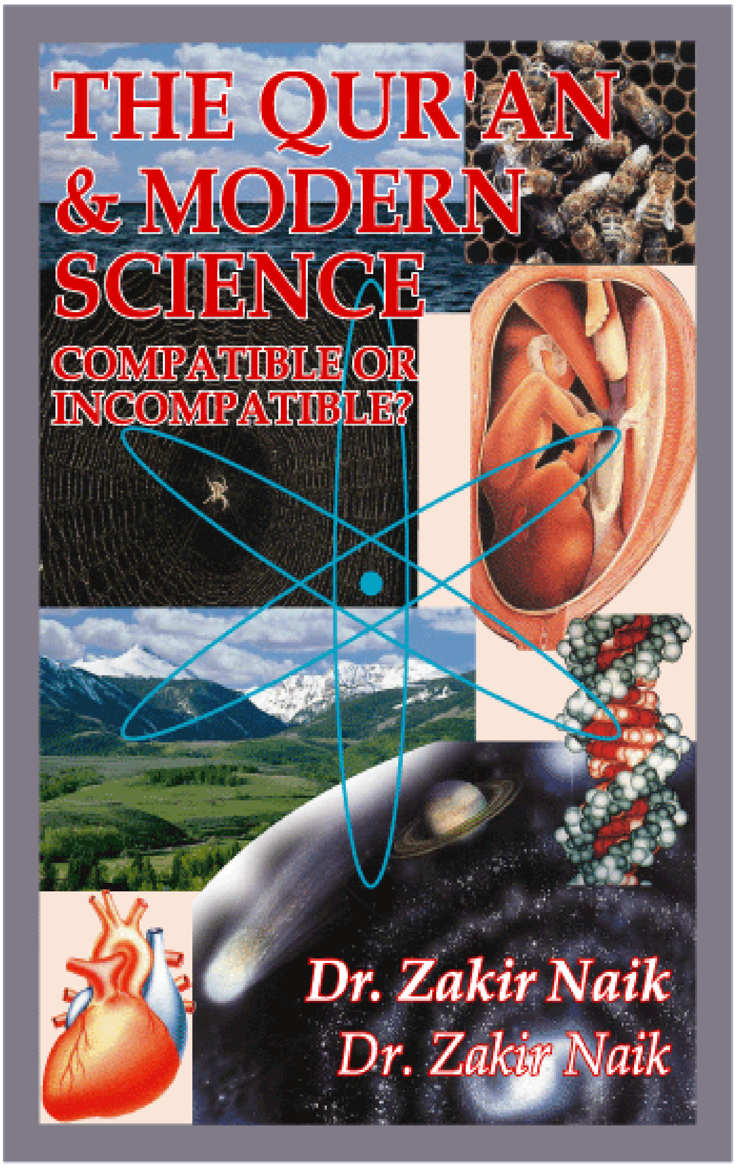
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THE QUR'AN AND MODERN SCIENCE COMPATIBLE OR INCOMPATIBLE ?

Authored by: Dr. Zakir Abdul Karim Naik



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In the Name of Allah, Most Gracious, Most Merciful

1. INTRODUCTION

Ever since the dawn of human life on this planet, Man has always tried to understand Nature, his own place in the scheme of Creation and the purpose of Life itself. In this quest for Truth, spanning many centuries and diverse civilizations, organized religion has shaped human life and, to a large extent, has determined the course of history. While some religions have been based on written text, claimed by their followers to be divinely inspired, others have relied solely on human experience.

Al-Qur'an, the main source of the Islamic faith, is a book believed by its followers, the Muslims, to be completely of Divine origin. Muslims also believe that it contains guidance for all humankind. Since the message of the Qur'an is believed to be for all times, it should be relevant to every age. But does the Qur'an pass this test?

In this booklet, I intend to give an objective analysis of the Muslim belief regarding the Divine origin of the Qur'an, particularly in the light of established scientific discoveries.

There was a time, in the history of world civilization, when 'miracles', or what were perceived to be miracles, took precedence over human reason and logic. Of course, the normal defination of 'miracle' is simply, anything that takes place out of the normal

course of life and for which humankind has no explanation.

However, we must be careful before accepting something as a miracle. In 1993, 'The Times of India', Mumbai, reported that 'a saint' by the name 'Baba Pilot' claimed to have stayed continuously submerged under water in a tank for three consecutive days and nights. However, when reporters wanted to examine the bottom of the tank of water in which he claimed to have performed his 'miraculous feat', he refused to let them do so. He argued by asking as to how one could examine the womb of a mother that gives birth to a child. Obviously the 'saint' had something to conceal! His claim was a gimmick simply to gain publicity. Surely, no modern person with even the slightest inkling towards rational thinking would accept such a 'miracle'. If such false miracles are the tests of divinity, then we would have to accept all world famous magicians known for their ingenious magical tricks and illusions, as genuine God-men!

A book, claiming to be of Divine origin, is in effect, claiming to be a miracle. Such a claim should be easily verifiable in any age, according to the standards of that age. Muslims believe, that the Qur'an is the last and final revelation of God, the miracle of miracles, revealed as a mercy to mankind. Let us therefore investigate the veracity of this belief.

THE CHALLENGE OF THE QUR'AN

Literature and poetry have been instruments of human expression and creativity, in all cultures. The world also witnessed an age when literature and poetry occupied pride of position, similar to that now enjoyed by science and technology.

Even non-Muslim scholars agree that the Qur'an is Arabic literature par excellence – that it is the best Arabic literature on the face of the earth. The Qur'an challenges mankind to produce the likes of it:

"And if ye are in doubt as to what We have revealed from time to time to Our servant,	وَاِنۡ كُنۡتُمۡ فِىۡ رَيۡبٍ مِّمَّا نَزَّلۡنَا عَلٰى عَبۡدِنَا
then produce a Surah like thereunto;	فَاۡتُوۡا بِسُوۡرَةٍ مِّنۡ مِّثۡلِهٖ
and call your witnesses or helpers (if there are any) besides Allah,	وَادۡعُوۡا شُهَدَآءَكُمۡ مِّنۡ دُوۡنِ اللّٰهِ
if your (doubts) are true.	اِنۡ كُنۡتُمۡ صٰدِقِيۡنَ ○
"But if ye cannot – and of a surety you cannot –	فَاِنۡ لَّمۡ تَفۡعَلُوۡا وَلَنۡ تَفۡعَلُوۡا
then fear the Fire whose fuel is Men and Stones –	فَاتَّقُوا النَّارَ الَّتِىۡ وَقُوۡدُهَا النَّاسُ وَالۡحِجَارَةُ ۖۚ
which is prepared for those who reject Faith."	اُعِدَّتۡ لِلۡكٰفِرِيۡنَ ○

[Al-Qur'an 2:23-24][1]

[1] Al-Qur'an 2:23-24 indicates *Surah* or Chapter No. 2 and *Aayaat* or Verses 23 and 24. The same notation is followed throughout this book. References and translation of the Qur'an are from the translation of the Qur'an by Abdullah Yusuf Ali, new revised edition, 1989, published by Amana Corporation, Maryland, USA.

The challenge of the Qur'an, is to produce a single *Surah* (chapter) like the *Surahs* it contains. The same challenge is repeated in the Qur'an several times. The challenge to produce a *Surah*, which, in beauty, eloquence, depth and meaning is at least somewhat similar to a Qur'anic *Surah* remains unmet to this day.

A modern rational man, however, would never accept a religious scripture which says, in the best possible poetic language, that the world is flat. This is because we live in an age, where human reason, logic and science are given primacy. Not many would accept the Qur'an's extraordinarily beautiful language, as proof of its Divine origin. Any scripture claiming to be a divine revelation must also be acceptable on the strength of its own reason and logic.

According to the famous physicist and Nobel Prize winner, Albert Einstein, "Science without religion is lame. Religion without science is blind." Let us therefore study the Qur'an, and analyze whether the Qur'an and Modern Science are compatible or incompatible?

The Qur'an is not a book of Science but a book of 'Signs', i.e. *Aayaats*. There are more than six thousand 'Signs' in the Qur'an of which more than a thousand deal with hard core Science.

We all know that many a times Science takes a 'U-turn'. In this book I have considered only established scientific facts and not hypotheses and theories based on mere assumptions and not backed by proof.

2. ASTRONOMY

CREATION OF THE UNIVERSE: 'THE BIG BANG'

The creation of the universe is explained by astrophysicists as a widely accepted phenomenon, popularly known as 'The Big Bang'. It is supported by observational and experimental data gathered by astronomers and astrophysicists for decades. According to 'The Big Bang', the whole universe was initially one big mass (Primary Nebula). Then there was a 'Big Bang' (Secondary Separation) which resulted in the formation of Galaxies. These then divided to form stars, planets, the sun, the moon, etc. The origin of the universe was unique and the probability of it happening by 'chance' is nil.

The Qur'an contains the following verse regarding the origin of the universe:

"Do not the Unbelievers see that the heavens and the earth	أَوَلَمْ يَرَ الَّذِينَ كَفَرُوٓا
were joined together (as one unit of Creation), before	أَنَّ السَّمٰوٰتِ وَالْأَرْضَ
We clove them asunder?"	كَانَتَا رَتْقًا فَفَتَقْنٰهُمَا ؕ

[Al-Qu'ran 21:30]

The striking similarity between the Qur'anic verse and 'The Big Bang' is inescapable! How could a book, which first appeared in the deserts of Arabia 1400 years ago, contain this profound scientific truth?

INITIAL GASEOUS MASS BEFORE CREATION OF GALAXIES

Scientists agree that before the galaxies in the universe were formed, celestial matter was initially in the form of gaseous matter. In short, huge gaseous matter or clouds were present before the formation of the galaxies. To describe initial celestial matter, the word 'smoke' is more appropriate than gas. The following Qur'anic verse refers to this state of the universe by the word *dukhaan* which means smoke.

"Moreover, He Comprehended in His design the sky,	ثُمَّ اسْتَوٰٓى اِلَى السَّمَآءِ
and it had been (as) smoke:	وَهِىَ دُخَانٌ
He said to it and to the earth: 'Come ye together,	فَقَالَ لَهَا وَلِلْاَرْضِ ائْتِيَا
willingly or unwillingly.'	طَوْعًا اَوْ كَرْهًا ؕ
They said: 'We do come (together), in willing obedience.'"	قَالَتَآ اَتَيْنَا طَآئِعِيْنَ ۝

[Al-Qur'an 41:11]

Again, this fact is a corollary to the 'Big Bang' and was not known to anyone before the prophetehood of Muhammad (Peace be upon him)[1]. What then, could have been the source of this knowledge?

[1] Muslims also send salutations upon all the previous divinely inspired Prophets on taking their names.

SHAPE OF THE EARTH IS SPHERICAL

In early times, people believed that the earth was flat. For centuries, men were afraid to venture out too far, for fear of falling off the edge! Sir Francis Drake was the first person who proved that the earth is spherical when he sailed around it in 1597.

Consider the following Qur'anic verse regarding the alternation of day and night:

"Seest thou not that Allah
merges Night into Day
and He merges Day into Night?"

أَلَمْ تَرَ أَنَّ اللّٰهَ
يُولِجُ الَّيْلَ فِى النَّهَارِ
وَيُولِجُ النَّهَارَ فِى الَّيْلِ

[Al-Qur'an 31:29]

Merging here means that the night slowly and gradually changes to day and vice versa. This phenomenon can only take place if the earth is spherical. If the earth was flat, there would have been a sudden change from night to day and from day to night.

The following verse also alludes to the spherical shape of the earth:

"He created the heavens and the earth in true (proportions):

خَلَقَ السَّمٰوٰتِ وَالْاَرْضَ بِالْحَقِّ

He makes the Night overlap the Day,

يُكَوِّرُ الَّيْلَ عَلَى النَّهَارِ

and the Day overlap the Night." وَيُكَوِّرُ النَّهَارَ عَلَى الَّيْلِ

[Al-Qur'an 39:5]

The Arabic word used here is *Kawwara* meaning 'to overlap' or 'to coil'– the way a turban is wound around the head. The overlapping or coiling of the day and night can only take place if the earth is spherical.

The earth is not exactly round like a ball, but geo-spherical, i.e. it is flattened at the poles. The following verse contains a description of the earth's shape:

"And the earth, moreover, hath He made egg shaped." وَالْأَرْضَ بَعْدَ ذَٰلِكَ دَحٰهَا

[Al-Qur'an 79:30]

The Arabic word for egg here is *dahaahaa*[1] which means an ostrich-egg. The shape of an ostrich-egg resembles the geo-spherical shape of the earth.

Thus the Qur'an correctly describes the shape of the earth, though the prevalent notion when the Qur'an was revealed was that the earth was flat.

MOONLIGHT IS REFLECTED LIGHT

It was believed by earlier civilizations that the moon emanates its own light. Science now tells us

[1] The Arabic word *dahaahaa* has been translated by A. Yusuf Ali as "vast expanse", which also is correct. This word also means an ostrich-egg.

that the light of the moon is reflected light. However this fact was mentioned in the Qur'an 1,400 years ago in the following verse:

"Blessed is He Who made Constellations in the skies,	تَبٰرَكَ الَّذِىۡ جَعَلَ فِى السَّمَآءِ
and placed therein a Lamp	بُرُوۡجًا وَّجَعَلَ فِيۡهَا سِرٰجًا
and a Moon giving light."	وَّقَمَرًا مُّنِيۡرًا ۝

[Al-Qur'an 25:61]

The Arabic word for the sun in the Qur'an, is *shams*. It is also referred to as *siraaj* which means a 'torch' or as *wahhaaj* meaning 'a blazing lamp' or as *diya* which means 'shining glory'. All three descriptions are appropriate to the sun, since it generates intense heat and light by its internal combustion. The Arabic word for the moon is *qamar* and it is described in the Qur'an as *muneer* which is a body that gives *noor* i.e. reflected light. Again, the Qur'anic description matches perfectly with the true nature of the moon which does not give off light by itself and is an inactive body that reflects the light of the sun. Not once in the Qur'an, is the moon mentioned as *siraaj*, *wahhaaj* or *diya* nor the sun as *noor* or *muneer*. This implies that the Qur'an recognizes the difference between the nature of sunlight and moonlight.

The following verses relate to the nature of light from the sun and the moon:

"It is He who made the sun to be a shining glory هُوَ الَّذِي جَعَلَ الشَّمْسَ ضِيَاءً

and the moon to be a light (of beauty)." وَالْقَمَرَ نُورًا

[Al-Qur'an 10:5]

"See ye not how Allah has created أَلَمْ تَرَوْا كَيْفَ خَلَقَ اللَّهُ

the seven heavens one above another, سَبْعَ سَمَاوَاتٍ طِبَاقًا

"And made the moon a light in their midst, وَجَعَلَ الْقَمَرَ فِيهِنَّ نُورًا

and made the sun as a (Glorious) Lamp?" وَجَعَلَ الشَّمْسَ سِرَاجًا

[Al-Qur'an 71:15-16]

The Glorious Qur'an and modern science, are thus in perfect agreement about the differences in the nature of sunlight and moonlight.

THE SUN ROTATES

For a long time European philosophers and scientists believed that the earth stood still in the centre of the universe and every other body including the sun moved around it. In the West, this geocentric concept of the universe was prevalent right from the time of Ptolemy in the second century B.C. In 1512, Nicholas Copernicus put forward his Heliocentric Theory of Planetary Motion, which asserted that the sun is

motionless at the centre of the solar system with the planets revolving around it.

In 1609, the German scientist Yohannus Keppler published the '*Astronomia Nova*'. In this he concluded that not only do the planets move in elliptical orbits around the sun, they also rotate upon their axes at irregular speeds. With this knowledge it became possible for European scientists to explain correctly many of the mechanisms of the solar system, including the sequence of night and day.

After these discoveries, it was thought that the Sun was stationary and did not rotate about its axis like the Earth. I remember having studied this fallacy from Geography books during my school days.

Consider the following Qur'anic verse:

وَهُوَ الَّذِىْ خَلَقَ الَّيْلَ وَالنَّهَارَ وَالشَّمْسَ وَالْقَمَرَ كُلٌّ فِىْ فَلَكٍ يَّسْبَحُوْنَ

"It is He Who created the Night and the Day,

and the sun and the moon:

All (the celestial bodies) swim along, each in its rounded course."

[Al-Qur'an 21:33]

The Arabic word used in the above verse is *yasbahoon* . This word is derived from the word *sabaha*. It carries with it the idea of motion that comes from any moving body. If you use this word for a person on the ground, it would not mean that he is rolling but would imply that he is walking or

running. If you use this word for a person in water, it would not mean that he is floating but would imply that he is swimming.

Similarly, if you use the word *yasbah* for a celestial body such as the sun, it would not only mean that it is flying through space but would also mean that it is rotating as it goes through space. Most school textbooks have now incorporated the fact that the sun rotates about its axis. The rotation of the sun about its own axis can be proved with the help of an equipment that projects the image of the sun on the top of a table, so that one can examine the image of the sun without being blinded. It is noticed that the sun has spots which complete a circular motion once every 25 days i.e. the sun takes approximately 25 days to rotate round its axis.

The sun travels through space at roughly 240 km per second, and takes about 200 million years to complete one revolution around the centre of our Milky Way Galaxy.

"It is not permitted to the Sun to catch up the Moon,	لَا الشَّمْسُ يَنۢبَغِيْ لَهَآ اَنْ تُدْرِكَ الْقَمَرَ
nor can the Night outstrip the Day:	وَلَا الَّيْلُ سَابِقُ النَّهَارِ ۭ
Each (just) swims along in (its own) orbit (according to Law)."	وَكُلٌّ فِيْ فَلَكٍ يَّسْبَحُوْنَ ۝

[Al-Qur'an 36:40]

This verse mentions an essential fact discovered

only recently by modern astronomy, i.e. the existence of the individual orbits of the Sun and the Moon, and their journey through space with their own motion.

The 'fixed place' towards which the sun travels, carrying with it the solar system, has been located preirsely by modern astronomy. It has been given a name, the Solar Apex. The solar system is indeed moving in space towards a point situated in the constellation of Hercules (alpha Lyrae) whose exact location is now firmly established.

The moon rotates around its axis in the same duration that it takes to revolve around the earth. It takes approximately 29½ days to complete one rotation.

One cannot help but be amazed at the scientific accuracy of the Qur'anic verses. Should we not ponder over the question: "What is the source of knowledge contained in the Qur'an?"

THE SUN WILL EXTINGUISH

The light of the sun is due to a chemical process on its surface that has been taking place continuously for the past five billion years. It will come to an end at some point of time in the future, when the sun will be totally extinguished, leading to extinction of all life on earth. Regarding the impermanence of the sun's existence, the Qur'an says:

وَالشَّمْسُ تَجْرِى

"And the Sun runs its course

for a period determined for it; that is	لِمُسْتَقَرٍّ لَّهَا ۚ ذَٰلِكَ
the decree of (Him) the exalted in Might, the All-Knowing."	تَقْدِيرُ الْعَزِيزِ الْعَلِيمِ ۝

***[Al-Qur'an 36:38]*[1]**

The Arabic word used here is *mustaqarr*, which means a place or time that is determined. Thus the Qur'an says that the sun runs towards a determined place, and will do so only up to a pre-determined period of time – meaning that it will end or extinguish.

INTERSTELLAR MATTER

Space outside organized astronomical systems was earlier assumed to be a vacuum. Astrophysicists later discovered the presence of bridges of matter in this interstellar space. These bridges of matter are called plasma, and consist of completely ionized gas containing equal number of free electrons and positive ions. Plasma is sometimes called the fourth state of matter (besides the three known states viz. solid, liquid and gas). The Qur'an refers to the presence of this interstellar material in the following verse:

"He Who created the heavens	الَّذِىْ خَلَقَ السَّمٰوٰتِ

[1]A similar message is conveyed in the Qur'an in 13:2, 35:13, 39:5 and 39:21.

and the earth and all that is between." وَالْاَرْضَ وَمَا بَيْنَهُمَا

[Al-Qur'an 25:59]

It would be ridiculous for anyone to even suggest that the presence of interstellar galactic material was known 1400 years ago!

THE EXPANDING UNIVERSE

In 1925, American astronomer Edwin Hubble, provided observational evidence that all galaxies are moving away from one another, which implies that the universe is expanding. The expansion of the universe is now an established scientific fact. This is what the Qur'an says regarding the nature of the universe:

"With power and skill did We construct the Firmament: وَالسَّمَآءَ بَنَيْنٰهَا

For it is We Who create the vastness of Space." بِاَيْدٍ وَّاِنَّا لَمُوْسِعُوْنَ ۝

[Al-Qur'an 51:47]

The Arabic word *musioon* is correctly translated as 'expanding it', and it refers to the creation of the expanding vastness of the universe.

One of the greatest astrophysicist Stephen Hawking, in his book, 'A Brief History of Time',

says, "The discovery that the universe is expanding was one of the great intellectual revolutions of the 20th century." The Qur'an mentioned the expansion of the universe, before man even learnt to build a telescope!

Some may say that the presence of astronomical facts in the Qur'an is not surprising since the Arabs were advanced in the field of astronomy. They are correct in acknowledging the advancement of the Arabs in the field of astronomy. However they fail to realize that the Qur'an was revealed centuries before the Arabs excelled in astronomy. Moreover many of the scientific facts mentioned above, such as the origin of the universe with a Big Bang, were not known to the Arabs even at the peak of their scientific advancement. The scientific facts mentioned in the Qur'an are therefore not due to the Arabs' advancement in astronomy. Indeed, the reverse is true: they advanced in astronomy, because astronomy occupies a place in the Qur'an.

3. PHYSICS

ATOMS CAN BE DIVIDED

In ancient times a well-known theory by the name of 'Theory of Atomism' was widely accepted. This theory was originally proposed by the Greeks, in particular by a scholar called Democritus, who lived about 23 centuries ago. Democritus and the people that came after him, assumed that the smallest unit of matter was the atom. The ancient Arabs used to believe the same. The Arabic word *zarrah* most commonly meant an atom. In recent times modern science has discovered that it is possible to split even an atom. That the atom can be split further is a development of the 20th century. Fourteen centuries ago this concept would have appeared unusual even to an Arab. For him the *zarrah* was the limit beyond which one could not go. The following Qur'anic verse however, refuses to acknowledge this limit:

"The Unbelievers say,	وَقَالَ الَّذِينَ كَفَرُوا لَا
'Never to us will come The Hour':	تَأْتِينَا السَّاعَةُ ۖ قُلْ بَلَىٰ
say, 'Nay! but most surely, by my Lord, it will come upon you –	وَرَبِّي لَتَأْتِيَنَّكُمْ عَالِمِ الْغَيْبِ

by Him Who knows the unseen – from Whom is not hidden the least little atom	عٰلِمِ الْغَيْبِ ۚ لَا يَعْزُبُ عَنْهُ مِثْقَالُ ذَرَّةٍ
in the Heavens or on earth:	فِي السَّمٰوٰتِ وَلَا فِي الْأَرْضِ
nor is there anything less than that, or greater, but	وَلَآ أَصْغَرُ مِنْ ذٰلِكَ وَلَآ أَكْبَرُ
is in the Record Perspicuous.'"	إِلَّا فِي كِتٰبٍ مُّبِينٍ ۝

[Al-Qur'an 34:3][1]

This verse also refers to the Omniscience of God, His knowledge of all things, hidden or apparent. It then goes further and says that God is aware of everything, including what is smaller or bigger than the atom. Thus the verse clearly shows that it is possible for something smaller than the atom to exist, a fact discovered only recently by modern science.

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[1] A similar message is conveyed in the Qur'an in 10:61.

4. HYDROLOGY

THE WATER CYCLE

In 1580, Bernard Palissy was the first person to describe the present day concept of 'water cycle'. He described how water evaporates from the oceans and cools to form clouds. The clouds move inland where they rise, condense and fall as rain. This water gathers as lakes and streams and flows back to the ocean in a continuous cycle. In the 7th century B.C., Thales of Miletus believed that surface spray of the oceans was picked up by the wind and carried inland to fall as rain.

In earlier times people did not know the source of underground water. They thought the water of the oceans, under the effect of winds, was thrust towards the interior of the continents. They also believed that the water returned by a secret passage or the Great Abyss. This passage is connected to the oceans and has been called the 'Tartarus', since Plato's time. Even Descartes, a great thinker of the eighteenth century, subscribed to this view. Till the nineteenth century, Aristotle's theory was still prevalent. According to this theory, water was condensed in cool mountain caverns and formed underground lakes that fed springs. Today, we have come to know that the rainwater that seeps into the cracks of the ground is responsible for this.

This is described by the Qur'an in the following verses:

"Seest thou not that Allah	أَلَمْ تَرَ أَنَّ اللّٰهَ
sends down rain from the sky,	أَنْزَلَ مِنَ السَّمَآءِ مَآءً
and leads it through springs in the earth?	فَسَلَكَهُ يَنَابِيعَ فِي الْأَرْضِ
then He causes to grow, therewith, produce of various colours."	ثُمَّ يُخْرِجُ بِهِ زَرْعًا مُّخْتَلِفًا أَلْوَانُهُ

[Al-Qur'an 39:21]

"He sends down rain from the sky	وَيُنَزِّلُ مِنَ السَّمَآءِ مَآءً
and with it gives life to the earth after it is dead:	فَيُحْيِي بِهِ الْأَرْضَ بَعْدَ مَوْتِهَا
Verily in that are Signs for those who are wise."	إِنَّ فِي ذٰلِكَ لَآيٰتٍ لِّقَوْمٍ يَّعْقِلُونَ ○

[Al-Qur'an 30:24]

"And We send down water from the sky	وَأَنْزَلْنَا مِنَ السَّمَآءِ مَآءً
according to (due) measure, and We cause it to soak in the soil;	بِقَدَرٍ فَأَسْكَنّٰهُ فِي الْأَرْضِ
and We certainly are able to drain it off (with ease)."	وَإِنَّا عَلٰى ذَهَابٍ بِهِ لَقٰدِرُونَ ۚ

[Al-Qur'an 23:18]

No other text dating back 1400 years ago gives such an accurate description of the water cycle.

EVAPORATION

"By the Firmament which returns (in its round),"

وَالسَّمَآءِ ذَاتِ الرَّجْعِ ۝

[Al-Qur'an 86:11]

WINDS IMPREGNATE CLOUDS

"And We send the fecundating winds,

وَاَرْسَلْنَا الرِّيٰحَ لَوَاقِحَ

then cause the rain to descend from the sky,

فَاَنْزَلْنَا مِنَ السَّمَآءِ مَآءً

therewith providing you with water (in abundance)."

فَاَسْقَيْنٰكُمُوْهُ ۚ

[Al-Qur'an 15:22]

The Arabic word used here is *lawaaqih* which is the plural of *laqih* from *laqaha*, which means to impregnate or fecundate. In this context, impregnate means that the wind pushes the clouds together increasing the condensation that causes lightning and thus rain. A similar description is found in the following verses of the Qur'an:

"Seest thou not that Allah makes the clouds move gently, then joins them together, then makes them into a heap?–then wilt thou see rain issue forth from their midst. And He sends down from the sky

اَلَمْ تَرَ اَنَّ اللّٰهَ يُزْجِىْ سَحَابًا
ثُمَّ يُؤَلِّفُ بَيْنَهٗ ثُمَّ
يَجْعَلُهٗ رُكَامًا فَتَرَى الْوَدْقَ
يَخْرُجُ مِنْ خِلٰلِهٖ ۚ وَيُنَزِّلُ
مِنَ السَّمَآءِ مِنْ جِبَالٍ فِيْهَا

mountain masses (of clouds) wherein is hail: He strikes	مِنۢ بَرَدٍ فَيُصِيبُ بِهِۦ مَن
therewith whom He pleases and He turns it away	يَشَآءُ وَيَصْرِفُهُۥ عَن مَّن
from whom He pleases. the vivid flash of His lightning	يَشَآءُ ۖ يَكَادُ سَنَا بَرْقِهِۦ
well-nigh blinds the sight.”	يَذْهَبُ بِٱلْأَبْصَٰرِ ۝

[Al-Qur’an 24:43]

“It is Allah Who sends the Winds, and they raise the Clouds:	ٱللَّهُ ٱلَّذِى يُرْسِلُ ٱلرِّيَٰحَ فَتُثِيرُ سَحَابًا
then does He spread them in the sky as He wills,	فَيَبْسُطُهُۥ فِى ٱلسَّمَآءِ كَيْفَ يَشَآءُ
and break them into fragments, until thou seest raindrops issue from the midst thereof:	وَيَجْعَلُهُۥ كِسَفًا فَتَرَى ٱلْوَدْقَ يَخْرُجُ مِنْ خِلَٰلِهِۦ
then when He has made them reach such of His servants as He wills,	فَإِذَآ أَصَابَ بِهِۦ مَن يَشَآءُ مِنْ عِبَادِهِۦٓ
behold, they do rejoice!”	هُمْ يَسْتَبْشِرُونَ ۝

[Al-Qur’an 30:48]

Modern data on Hydrology agrees perfectly with the Qur'anic description on the same subject.

The water cycle is described in several other verses of the Glorious Qur’an, including 7:57, 13:17, 25:48-49, 35:9, 36:34, 45:5, 50:9-11, 56:68-70 and 67:30.

5. GEOLOGY

MOUNTAINS ARE LIKE TENT PEGS

In geology, the phenomenon of 'folding', is a recently discovered fact. Folding is responsible for the formation of mountain ranges. The earth's crust, on which we live, is like a solid shell, while the deeper layers are hot and fluid, and thus inhospitable to any form of life. It is also known that the stability of the mountains is linked to the phenomenon of folding, for it was the folds that were to provide foundations for the reliefs that constitute the mountains.

Geologists tell us that the radius of the Earth is about 6,035 km and the crust on which we live is very thin, ranging between 2 to 35 km. Since the crust is thin, it has a high possibility of shaking. Mountains act like stakes or tent pegs that hold the earth's crust and give it stability. The Qur'an contains exactly such a description:

"Have We not made the earth as a wide expanse, أَلَمْ نَجْعَلِ الْأَرْضَ مِهَادًا ۝

and the mountains as pegs?" وَّالْجِبَالَ أَوْتَادًا ۝

[Al-Qur'an 78:6-7]

The word *awtaad* means stakes or pegs (like those used to anchor a tent); they are the deep foundations of geological folds.

A book entitled 'Earth' is regarded as a basic reference textbook on geology in many universities around the world. One of the authors of this book is Dr. Frank Press, who was the President of the Academy of Sciences in the USA for 12 years and was the Science Advisor to former US President Jimmy Carter. In this book, he illustrates the mountain in a wedge-shape and the mountain itself as a small part of the whole, whose root is deeply entrenched in the ground.[1] According to Dr. Press, the mountains play an important role in stabilizing the crust of the earth.

The Qur'an clearly mentions the function of the mountains in preventing the earth from shaking:

"And We have set on the earth mountains standing firm, وَجَعَلْنَا فِي الْأَرْضِ رَوَاسِيَ

lest it should shake with them." أَنْ تَمِيدَ بِهِمْ

[Al-Qur'an 21:31][2]

The Qur'anic descriptions are in perfect agreement with modern geological data.

MOUNTAINS FIRMLY FIXED

The surface of the earth is broken into many rigid plates that are about 100 km in thickness. These

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[1] *Earth*, Press and Siever, p. 435. Also see *Earth Science*, Tarbuck and Lutgens, p. 157
[2] A similar message is contained in the Qru'an in 31:10 and 16:15

plates float on a partially molten region called aesthenosphere.

Mountain formations occur at the boundary of the plates. The earth's crust is 5 km thick below oceans, about 35 km thick below flat continental surfaces and almost 80 km thick below great mountain ranges. These are the strong foundations on which mountains stand. The Qur'an refers to the strong mountain foundations in the following verse:

"And the mountains hath He firmly fixed." وَالْجِبَالَ أَرْسَاهَا ۝

[Al-Qur'an 79:32][1]

Thus, the information contained in the Glorious Qur'an about the nature of mountains, is in perfect agreement with recent discoveries in geology.

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[1] A similar message is contained in the Qur'an in 88:19.

6. OCEANOLOGY

BARRIER BETWEEN SWEET AND SALT WATERS

"He has let free the two bodies of flowing water, meeting together: مَرَجَ الْبَحْرَيْنِ يَلْتَقِيَانِ ۙ

Between them is a Barrier which they do not transgress." بَيْنَهُمَا بَرْزَخٌ لَّا يَبْغِيَانِ ۚ

[Al-Qur'an 55:19-20]

In the Arabic text the word *barzakh* means a barrier or a partition. This barrier, however, is not a physical partition. The Arabic word *maraja* literally means 'they both meet and mix with each other'. Early commentators of the Qur'an were unable to explain the two opposite meanings for the two bodies of water, i.e. they meet and mix, and at the same time there is a barrier between them. Modern Science has discovered that in the places where two different seas meet, there is a barrier between them. This barrier divides the two seas so that each sea has its own temperature, salinity and density.[1] Oceanologists are now in a better position to explain this verse. There is a slanted unseen water barrier between the two seas through which water from one sea passes to the other.

But when the water from one sea enters the other sea, it loses its distinctive characteristic and

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[1] *Principles of Oceanography,* Davis, pp. 92-93.

becomes homogenized with the other water. In a way this barrier serves as a transitional homogenizing area for the two waters.

This phenomenon is also mentioned in the following verse of the Qur'an:

"And made a separating bar between the two bodies of flowing water?"

وَجَعَلَ بَيْنَ الْبَحْرَيْنِ حَاجِزًا ؕ

[Al-Qur'an 27:61]

This phenomenon occurs in several places, including the divider between the Mediterranean and the Atlantic Ocean at Gibralter. A white bar can also be clearly seen at Cape Point, Cape Peninsula, South Africa where the Atlantic Ocean meets the Indian Ocean.

But when the Qur'an speaks about the divider between fresh and salt water, it mentions the existence of "a forbidding partition" with the barrier.

"It is He Who has let free the two bodies of flowing water:

وَهُوَ الَّذِىْ مَرَجَ الْبَحْرَيْنِ

one palatable and sweet, and the other salty and bitter;

هٰذَا عَذْبٌ فُرَاتٌ وَّهٰذَا مِلْحٌ اُجَاجٌ

yet has He made a barrier between them, and a partition that is forbidden to be passed.

وَجَعَلَ بَيْنَهُمَا بَرْزَخًا وَّحِجْرًا مَّحْجُوْرًا ۝

[Al-Qur'an 25:53]

Modern science has discovered that in estuaries, where fresh (sweet) and salt water meet, the situation is somewhat different from that found in places where two salt water seas meet. It has been discovered that what distinguishes fresh water from salt water in estuaries is a "pycnocline zone with a marked density discontinuity separating the two layers."[1] This partition (zone of separation) has a salinity different from both the fresh water and the salt water.[2]

This phenomenon occurs in several places, including Egypt, where the river Nile flows into the Mediterranean Sea.

These scientific phenomena mentioned in the Qur'an was also confirmed by Dr. William Hay, a well-known marine scientist and Professor of Geological Sciences at the University of Colorado, U.S.A.

DARKNESS IN DEPTHS OF OCEAN

Prof. Durga Rao is a world renowned expert in the field of Marine Geology and was a professor at King Abdul Aziz University in Jeddah. He was asked to comment on the following verse:

"Or (the Unbelievers' state) is like the depths of darkness in a vast deep ocean,

أَوْ كَظُلُمَٰتٍ فِى بَحْرٍ لُّجِّىٍّ يَغْشَىٰهُ

[1] *Oceanography*, Gross, p. 242. Also see *Introductory Oceanography*, Thurman, pp. 300-301.
[2] *Oceanography*, Gross, p. 244 and *Introductory Oceanography*, Thurman, pp. 300-301.

overwhelmed with billow
topped by billow,
topped by (dark) clouds:

depths of darkness,
one above another:

if a man stretches out his hand,
he can hardly see it!

For any to whom Allah
giveth not light,
there is no light!"

[Al-Qur'an 24:40]

Prof. Rao said that scientists have only now been able to confirm, with the help of modern equipment, that there is darkness in the depths of the ocean. Humans are unable to dive unaided underwater for more than 20 to 30 metres, and cannot survive in the deep oceanic regions at a depth of more than 200 metres. This verse does not refer to all seas because not every sea can be described as having accumulated darkness layered one over another. It refers especially to a deep sea or deep ocean, as the Qur'an says, "darkness in a vast deep ocean". This layered darkness in a deep ocean is the result of two causes:

1. A light ray is composed of seven colours seen in the rainbow. These seven colours are Violet,

Indigo, Blue, Green, Yellow, Orange and Red (VIBGYOR). The light ray undergoes refraction when it hits water. The upper 10 to 15 metres of water absorb the red colour. Therefore, if a diver is 25 metres under water and gets wounded, he would not be able to see the red colour of his blood, because the red colour does not reach this depth. Similarly, orange rays are absorbed at 30 to 50 metres, yellow at 50 to 100 metres, green at 100 to 200 metres, and finally, blue beyond 200 metres and violet and indigo above 200 metres. Due to successive disappearance of colour, one layer after another, the ocean progressively becomes darker, i.e. darkness takes place in layers of light. Below a depth of 1000 meters there is complete darkness.[1]

2. The sun's rays are absorbed by clouds which in turn scatter light rays thus causing a layer of darkness under the clouds. This is the first layer of darkness. When light rays reach the surface of the ocean they are reflected by the wave surface giving it a shiny appearance. Therefore, it is the waves which reflect light and cause darkness. The unreflected light penetrates into the depths of the ocean. Thus, the ocean has two parts. The surface characterized by light and warmth and the depth characterized by darkness. The surface

[1] *Oceans*, Elder and Pernetta, p. 27.

is further separated from the deep part of the ocean by waves.

The internal waves cover the deep waters of seas and oceans because the deep waters have a higher density than the waters above them.

The darkness begins below the internal waves. Even the fish in the depths of the ocean cannot see; their only source of light is from their own bodies.

The Qur'an describes this aptly:

"Darkness in a vast deep ocean overwhelmed with waves topped by waves".

In other words, above these waves there are more types of waves, i.e. those found on the surface of the ocean. The Qur'anic verse continues, "topped by (dark) clouds; depths of darkness, one above another."

These clouds as explained are barriers one over the other that further cause darkness by absorption of colours at different levels.

Prof. Durga Rao concluded by saying, "1400 years ago a normal human being could not explain this phenomenon in so much detail. Thus the information must have come from a supernatural source".

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[1] The reference for this statment is the video tape titled '*This is the Truth*'. For a copy of this video tape contact the Islamic Research Foundation.

**"It is He Who has
Created man from water:**

**then has He established
relationships of lineage
and marriage:**

**for thy Lord has power
(over all things)."**

[Al-Qur'an 25:54]

Was it possible 14 centuries ago for any human being to guess that every living being was made from water? Moreover would such a guess be conceivable by a human being in the deserts of Arabia where there has always been scarcity of water?

8. BOTANY

PLANTS HAVE MALE AND FEMALE

Previously, humans did not know that plants too have male and female gender distinctions. Botany states that every plant has a male and female gender. Even the plants that are unisexual have distinct elements of both male and female.

"'And has sent down water from the sky.'	وَّاَنۡزَلَ مِنَ السَّمَآءِ مَآءًؕ
With it have We produced diverse pairs of plants	فَاَخۡرَجۡنَا بِهٖۤ اَزۡوَاجًا
each separate from the others."	مِّنۡ نَّبَاتٍ شَتّٰى ○

[Al-Qur'an 20:53]

FRUITS HAVE MALE AND FEMALE

"And fruit of every kind He made	وَمِنۡ كُلِّ الثَّمَرٰتِ جَعَلَ
in pairs, two and two."	فِيۡهَا زَوۡجَيۡنِ اثۡنَيۡنِ

[Al-Qur'an 13:3]

Fruit is the end product of reproduction of the superior plants. The stage preceding fruit is the flower, which has male and female organs (stamens and ovules). Once pollen has been carried to the flower, they bear fruit, which in turn matures and frees its seed. All fruits therefore imply the existence of male and female organs; a fact that is mentioned in the Qur'an.

In certain species, fruit can come from non-fertilized flowers (parthenocarpic fruit) e.g. bananas, certain types of pineapple, fig, orange, vine, etc. They also have definite sexual characteristics.

EVERYTHING MADE IN PAIRS

"And of everything We have created pairs."

وَمِن كُلِّ شَيْءٍ خَلَقْنَا زَوْجَيْنِ

[Al-Qur'an 51:49]

This verse lays emphasis on everything. Besides humans, animals, plants and fruits, it may also be referring to electricity in which the atoms consist of negatively – and positively – charged electrons and protons. And many more things!

"Glory to Allah, Who created in pairs

سُبْحَانَ الَّذِي خَلَقَ الْأَزْوَاجَ

all things that the earth produces,

كُلَّهَا مِمَّا تُنبِتُ الْأَرْضُ

as well as their own (human) kind

وَمِنْ أَنفُسِهِمْ

and (other) things of which they have no knowledge."

وَمِمَّا لَا يَعْلَمُونَ ۝

[Al-Qur'an 36:36]

The Qur'an here says that everything is created in pairs, including things that the humans do not know at present and may discover later.

9. ZOOLOGY

ANIMALS AND BIRDS LIVE IN COMMUNITIES

"There is not an animal (that lives) on the earth,	وَمَا مِن دَآبَّةٍ فِي الْأَرْضِ
nor a being that flies on its wings,	وَلَا طَـٰٓئِرٍ يَطِيرُ بِجَنَاحَيْهِ
but (forms part of) communities like you."	إِلَّآ أُمَمٌ أَمْثَالُكُم

[Al-Qur'an 6:38]

Research has shown that animals and birds live in communities, i.e. they organize, and live and work together.

THE FLIGHT OF BIRDS

"Do they not look at the birds, held poised in the midst of (the air and) the sky?	أَلَمْ يَرَوْا۟ إِلَى الطَّيْرِ مُسَخَّرَٰتٍ فِي جَوِّ السَّمَآءِ
Nothing holds them up but (the power of) Allah.	مَا يُمْسِكُهُنَّ إِلَّا اللَّهُ
Verily in this are Signs for those who believe."	إِنَّ فِي ذَٰلِكَ لَآيَـٰتٍ لِّقَوْمٍ يُؤْمِنُونَ ۝

[Al-Qur'an 16:79]

Another verse also touches on birds:

"Do they not observe the birds above them,	أَوَلَمْ يَرَوْا إِلَى الطَّيْرِ
spreading their wings and folding them in?	فَوْقَهُمْ صَٰٓفَّٰتٍ وَيَقْبِضْنَ
None can uphold them except (Allah) Most Gracious:	مَا يُمْسِكُهُنَّ إِلَّا الرَّحْمَٰنُ
truly it is He that watches over all things."	إِنَّهُۥ بِكُلِّ شَيْءٍۭ بَصِيرٌ ۝

[Al-Qur'an 67:19]

The Arabic word *amsaka* literally means, 'to put one's hand on, seize, hold, hold someone back,' which expresses the idea that Allah holds the bird up in His power. These verses stress the extremely close dependence of the birds' behaviour on Divine law. Modern scientific data has shown the degree of perfection attained by certain species of birds with regard to the programming of their movements. It is only the existence of a migratory programme in the genetic code of the birds that can explain the long and complicated journey that very young birds, without any prior experience and without any guide, are able to accomplish. They are also able to return to the departure point on a definite date.

Prof. Hamburger in his book 'Power and Fragility' gives the example of 'mutton-bird' that lives in the Pacific with its journey of over 24,000 km in the shape of figure '8'. It makes this journey over a

period of 6 months and comes back to its departure point with a maximum delay of one week. The highly complicated instructions for such a journey have to be contained in the birds' nervous cells. They are definitely programmed. Therefore, should we not at least reflect on the identity of this 'Programmer'?

THE BEE AND ITS SKILL

"And thy Lord taught the Bee to build its cells in hills,
وَاَوْحٰى رَبُّكَ اِلَى النَّحْلِ
اَنِ اتَّخِذِىْ مِنَ الْجِبَالِ بُيُوْتًا

on trees, and in (men's) habitations;
وَّمِنَ الشَّجَرِ وَمِمَّا يَعْرِشُوْنَ ۙ

then to eat of all the produce (of the earth),
ثُمَّ كُلِىْ مِنْ كُلِّ الثَّمَرٰتِ

and find with skill the spacious paths of its Lord."
فَاسْلُكِىْ سُبُلَ رَبِّكِ ذُلُلًا ۗ

[Al-Qur'an 16:68-69]

Von-Frisch received the Nobel Prize in 1973 for his research on the behaviour and communication of the bees. The bee, after discovering any new garden or flower, goes back and tells its fellow bees the exact direction and map to get there, which is known as 'bee dance'. The meanings of this insect's movements that are intended to transmit information between worker bees have been discovered scientifically using photography and other methods. The Qur'an mentions in the above verses how the bee with its skill, finds the spacious paths of its Lord.

The gender used for the bee in the above verses is the female gender (*fa'slukî* and *kulî*), indicating that the bee that leaves its home for gathering food is a female bee. In other words the soldier or worker bee is a female bee.

In fact, in Shakespeare's play, 'Henry the Fourth', some of the characters speak about bees and mention that the bees are soldiers and that they have a king. That is what people thought in Shakespearean times. They thought that the worker bees are male bees and they go home and are answerable to a king bee. This, however, is not true. The worker bees are females and they do not report to a king bee but to a queen bee. But it took modern investigations in the last 300 years to discover this.

SPIDER'S WEB, THE FRAGILE HOME

"The parable of those who take protectors other than Allah

مَثَلُ الَّذِينَ اتَّخَذُوا
مِن دُونِ اللَّهِ أَوْلِيَاءَ

is that of the Spider, who builds (to itself) a house;

كَمَثَلِ الْعَنكَبُوتِ ۖ
اتَّخَذَتْ بَيْتًا ۖ

but truly the flimsiest of houses is the Spider's house –

وَإِنَّ أَوْهَنَ الْبُيُوتِ
لَبَيْتُ الْعَنكَبُوتِ ۖ

if they but knew."

لَوْ كَانُوا يَعْلَمُونَ ۝

[Al-Qur'an 29:41]

Besides giving the physical description of the spider's web as being very flimsy, delicate and weak, the Qur'an also stresses on the flimsiness of the relationship in the spider's house, where the female spider many a times kills its mate, the male spider.

The parable also has reference to the weakness of such relationship of the people who seek protection for this world and for the hereafter from those other than Allah.

LIFESTYLE AND COMMUNICATION OF ANTS

"And before Solomon were marshalled his hosts –	وَحُشِرَ لِسُلَيْمٰنَ جُنُوْدُهٗ
of Jinns and men and birds,	مِنَ الْجِنِّ وَالْاِنْسِ وَالطَّيْرِ
and they were all kept in order and ranks.	فَهُمْ يُوْزَعُوْنَ ○
"At length, when they came to a (lowly) valley of ants,	حَتّٰىٓ اِذَآ اَتَوْا عَلٰى وَادِ النَّمْلِ
one of the ants said : 'O ye ants, get into your habitations,	قَالَتْ نَمْلَةٌ يّٰٓاَيُّهَا النَّمْلُ ادْخُلُوْا مَسٰكِنَكُمْ
lest Solomon and his hosts crush you (under foot) without knowing it.'"	لَا يَحْطِمَنَّكُمْ سُلَيْمٰنُ وَجُنُوْدُهٗ وَهُمْ لَا يَشْعُرُوْنَ ○

[Al-Qur'an 27:17-18]

In the past, some people would have probably mocked at the Qur'an, taking it to be a book of fairy tales in which ants talk to each other and communicate sophisticated messages. In recent times however, research has shown us several facts about the lifestyle of ants, which were not known earlier to humankind. Research has shown that the animals or insects whose lifestyle is closest in resemblance to the lifestyle of human beings are the ants. This can be seen from the following findings regarding ants:

(a) The ants bury their dead in a manner similar to the humans.

(b) They have a sophisticated system of division of labour, whereby they have managers, supervisors, foremen, workers, etc.

(c) Once in a while they meet among themselves to have a 'chat'.

(d) They have an advanced method of communication among themselves.

(e) They hold regular 'markets' where they exchange goods.

(f) They store grain for long periods in winter and if the grain begins to bud, they cut the roots, as if they understand that if they leave it to grow, it will rot. If the grain stored by them gets wet due to rains, they take it out into the sunlight to dry, and once dry, they take it back inside as though they know that humidity will cause development of root systems which will cause the grain to rot.

10. MEDICINE

HONEY: HEALING FOR HUMANKIND

The bee assimilates juices of various kinds of flowers and fruit and forms honey within its body, which it stores in its cells of wax. Only a couple of centuries ago humans came to know that honey comes from the belly of the bee. But this fact was mentioned in the Qur'an 1,400 years ago in the following verse:

"There issues from within their bodies يَخْرُجُ مِنْ بُطُونِهَا شَرَابٌ

a drink of varying colours, wherein is healing for men." مُّخْتَلِفٌ أَلْوَانُهُ فِيهِ شِفَآءٌ لِّلنَّاسِ

[Al-Qur'an 16:69]

We are only now aware that honey has healing properties and is also a mild antiseptic. The Russians would use honey to cover their wounds in World War II. The wound would retain moisture and would leave very little scar tissue. Due to the density of honey, no fungus or bacteria could grow in the wound.

Dramatic improvements were visible in 22 incurable chest and Alzheimer's disease patients at nursing Homes in England who were treated by Sister Carole, a nun, with propolis, a substance which bees produce to seal hives against bacteria.[1]

[1] The reference for this statment is the video tape titled '*This is the Truth*'. For a copy of this video tape contact the Islamic Research Foundation.

A person suffering from an allergy of a particular plant may be given honey from that plant so that the person develops resistance to that allergy. Honey is also rich in fructose and vitamin K.

The knowledge contained in the Qur'an regarding honey, its origin and properties, was discovered centuries after its revelation.

11. PHYSIOLOGY

BLOOD CIRCULATION AND MILK

The Qur'an was revealed 600 years before the Muslim scientist Ibn Nafees described the circulation of the blood and 1,000 years before William Harwey brought this understanding to the Western world. Roughly thirteen centuries before it was known what happens in the intestines to ensure that organs are nourished by the process of digestive absorption, a verse in the Qur'an described the source of the constituents of milk, in conformity with these notions.

To understand the Qur'anic verse concerning the above concepts, it is important to know that chemical reactions occur in the intestines and that, from there, substances extracted from food pass into the blood stream via a complex system; sometimes by way of the liver, depending on their chemical nature. The blood transports them to all the organs of the body, among which are the milk-producing mammary glands.

In simple terms, certain substances from the contents of the intestines enter into the vessels of the intestinal wall itself, and these substances are transported by the blood stream to the various organs.

This physiological concept must be fully appreciated if we wish to understand the following verses of the Qur'an:

"And verily in cattle there is a lesson for you.
وَإِنَّ لَكُمْ فِي الْأَنْعَامِ لَعِبْرَةً ۖ

We give you to drink of what is inside their bodies,
نُسْقِيكُمْ مِمَّا فِي بُطُونِهِ

coming from a conjunction between the contents of the intestine and the blood,
مِنْ بَيْنِ فَرْثٍ وَدَمٍ

a milk pure and pleasant for those who drink it."
لَبَنًا خَالِصًا سَائِغًا لِلشَّارِبِينَ ۝

[Al-Qur'an 16:66][1]

"And in cattle (too) ye have an instructive example:
وَإِنَّ لَكُمْ فِي الْأَنْعَامِ لَعِبْرَةً ۖ

from within their bodies We produce (milk) for you to drink;
نُسْقِيكُمْ مِمَّا فِي بُطُونِهَا

there are, in them, (besides), numerous (other) benefits for you;
وَلَكُمْ فِيهَا مَنَافِعُ كَثِيرَةٌ

and of their (meat) ye eat."
وَمِنْهَا تَأْكُلُونَ ۝

[Al-Qur'an 23:21]

[1] Translation of this Qur'anic verse is from the book "The Bible, the Qur'an and Science" by Dr. Maurice Bucaille.

The 1400 year old Qur'anic description of the production of milk in cattle is strikingly similar to what modern physiology has discovered in recent times

12. EMBRYOLOGY

MUSLIMS SEEK ANSWERS

A group of Muslim Scholars, under the direction of an eminent Yemani Scholar, Sheikh Abdul Majid Azzindani, collected information concerning embryology[1] and other sciences in the Qur'an and undisputed Hadith[2] and translated it into English. They then followed the Qur'anic advice:

"If ye realise this not, ask of those who possess the Message."

فَسْـَٔلُوٓا اَهْلَ الذِّكْرِ اِنْ كُنْتُمْ لَا تَعْلَمُوْنَ ۙ

[Al-Qur'an 16:43 & 21:7]

All the information from the Qur'an and the undisputed Hadith concerning embryology so gathered, after being translated into English and presented to Prof. (Dr.) Keith Moore, Professor of Embryology and Chairman of the Department of Anatomy at the University of Toronto, in Canada. At present he is one of the highest authorities in the field of Embryology.

He was asked to give his opinion regarding the material presented to him. After carefully examining it, Dr. Moore said that most of the

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[1] Embryology is the study of human development before birth.
[2] Hadith or Sunnah means the sayings or actions of Prophet Muhammed (pbuh).

information concerning embryology mentioned in the Qur'an and the undisputed Hadith is in perfect conformity with modern discoveries in the field of embryology and does not conflict with them in any way. He added that there were a few verses however, on whose scientific accuracy he could not comment. He could not say whether the statements were true or false, since he was himself unaware of the information contained therein. There was also no mention of this information in modern writings and studies on embryology.

One such verse is:

"Proclaim! (or Read!)	اِقْرَاْ
In the name of thy Lord and Cherisher, Who created –	بِاسْمِ رَبِّكَ الَّذِىْ خَلَقَ ۚ
Created man, out of a (mere) clot of congealed blood."	خَلَقَ الْاِنْسَانَ مِنْ عَلَقٍ ۚ

[Al-Qur'an 96:1-2]

The Arabic word *alaq*, besides meaning a congealed clot of blood, also means something that clings, a leech-like substance.

Dr. Keith Moore had no knowledge whether an embryo in the initial stages appears like a leech. To check this out he studied the initial stage of the embryo under a very powerful microscope and compared what he observed with the diagram of a leech. He was astonished at the striking resemblance between the two!

In the same manner, he acquired more information on embryology, that was hitherto not known to him, from the Qur'an.

Dr. Keith Moore answered about eighty questions dealing with embryological data mentioned in the Qur'an and Hadith. Noting that the information contained in the Qur'an and Hadith was in full agreement with the latest discoveries in the field of embryology, Prof. Moore said, "If I was asked these questions thirty years ago, I would not have been able to answer half of them for lack of scientific information".[1]

In 1981, during the Seventh Medical Conference in Dammam, Saudi Arabia, Dr. Moore said, "It has been a great pleasure for me to help clarify statements in the Qur'an about human development. It is clear to me that these statements must have come to Muhammad from God or Allah, because almost all of this knowledge was not discovered until many centuries later. This proves to me that Muhammad must have been a messenger of God or Allah".[2]

Dr. Keith Moore had earlier authored the book, 'The Developing Human'. After acquiring new knowledge from the Qur'an, he wrote, in 1982, the 3rd edition of the same book, 'The Developing

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[1] xxxxxxxxxxxxxxxxx

[2] The reference for this statment is the video tape titled '*This is the Truth*'. For a copy of this video tape contact the Islamic Research Foundation.

Human'. The book was the recipient of an award for the best medical book written by a single author. This book has been translated into several major languages of the world and is used as a textbook of embryology in the first year of medical studies.

Dr. Joe Leigh Simpson, Chairman of the Department of Obstetrics and Gynaecology, at the Baylor College of Medicine, Houston, U.S.A., proclaims: "...these Hadiths, sayings of Muhammad (pbuh), could not have been obtained on the basis of the scientific knowledge that was available at the time of the writer (implying in the 7th century). It follows that not only is there no conflict between genetics and religion (implying Islam) but in fact religion (Islam) may guide science by adding revelation to some of the traditional scientific approaches . . . there exist statements in the Qur'an shown centuries later to be valid which support knowledge in the Qur'an having been derived from God."

DROP EMITTED FROM BETWEEN THE BACK BONE AND THE RIBS

"Now let man but think from what he is created!	فَلْيَنظُرِ الْإِنسَانُ مِمَّ خُلِقَ ۝
He is created from a drop emitted –	خُلِقَ مِن مَّاءٍ دَافِقٍ ۝
Proceeding from between the back bone and the ribs."	يَخْرُجُ مِن بَيْنِ الصُّلْبِ وَالتَّرَائِبِ ۝

[Al-Qur'an 86:5-7]

In embryonic stages, the reproductive organs of the male and female, i.e. the testicles and the ovaries, begin their development near the kidney between the spinal column and the eleventh and twelfth ribs. Later they descend; the female gonads (ovaries) stop in the pelvis while the male gonads (testicles) continue their descent before birth to reach the scrotum through the inguinal canal. Even in adulthood after the descent of the reproductive organs, these organs receive their nerve supply and blood supply from the Abdominal Aorta, which is in the area between the backbone (spinal column) and the ribs. The lymphatic drainage and the venous return also go to the same area.

NUTFAH – MINUTE QUANTITY OF LIQUID

The Glorious Qur'an mentions no less than eleven times that the human being is created from *nutfah*, which means a minute quantity of liquid or a trickle of liquid that remains after emptying a cup. This is mentioned in several verses of the Qur'an including 22:5 and 23:13.[1]

Science has confirmed in recent times that only one out of an average of three million sperms is required for fertilising the ovum. This means that only $^1/_3$ millionth part or 0.00003% of the quantity of sperms that are emitted is required for fertilisation.

[1] The same is also mentioned in the Qur'an in 16:4, 18:37, 35:11, 36:77, 40:67, 53:46, 75:37, 76:2 and 80:19.

SULALAH – QUINTESSENCE OF LIQUID

"And made his progeny from a quintessence of the nature of a fluid despised."

ثُمَّ جَعَلَ نَسْلَهُۥ مِن سُلَٰلَةٍ مِّن مَّآءٍ مَّهِينٍ ۚ

[Al-Qur'an 32:8]

The Arabic word *sulaalah* means quintessence or the best part of a whole. We have come to know now that only one single spermatozoon that penetrates the ovum is required for fertilization, out of the several million produced by man. That one spermatozoon out of several million, is referred to in the Qur'an as *sulaalah*. We have also come to know now that only one ovum is fertilized out of the tens of thousand produced by the female. That one ovum out of tens of thousand is also refered to in the Qur'an as *Sulaalah*. This word also means gentle extraction from a fluid. The fluid refers to both male and female germinal fluids containing gametes. Both ovum and sperm are gently extracted from their environments in the process of fertilization.

NUTFATUN AMSHAAJ – MINGLED LIQUIDS

"Verily We created man from a drop of mingled sperm."

إِنَّا خَلَقْنَا ٱلْإِنسَٰنَ مِن نُّطْفَةٍ أَمْشَاجٍ

[Al-Qur'an 76:2]

The Arabic word *nutfatin amshaajin* means mingled liquids. According to some commentators of the Qur'an, mingled liquids refers to the male or female agents or liquids. After mixture of male and female gamete, the zygote still remains *nutfah*. Mingled liquids can also refer to spermatic fluid that is formed of various secretions that come from various glands.

Therefore, *nutfatin amshaaj*, i.e. a minute quantity of mingled fluids refers to the male and female gametes (germinal fluids or cells) and part of the surrounding fluids.

SEX DETERMINATION

The sex of a foetus is determined by the nature of the sperm and not of the ovum. The sex of the child, whether female or male, depends on whether the 23rd pair of chromosomes is XX or XY respectively.

Primarily, sex determination occurs at fertilization and depends upon the type of sex chromosome in the sperm that fertilizes an ovum. If it is an 'X' bearing sperm that fertilizes the ovum, the foetus is a female and if it is a 'Y' bearing sperm then the foetus is a male.

وَأَنَّهُۥ خَلَقَ ٱلزَّوْجَيْنِ ٱلذَّكَرَ وَٱلْأُنثَىٰ ۝
مِن نُّطْفَةٍ إِذَا تُمْنَىٰ ۝

"That He did create in pairs–male and female,

from a seed when lodged (in its place)."

[Al-Qur'an 53:45-46]

The Arabic word *nutfah* means a minute quantity of liquid and *tumnaa* means ejaculated or planted.

Therefore *nutfah* specifically refers to sperm because it is ejaculated.

The Qur'an says:

"Was he not a drop of sperm emitted (in lowly form)?

أَلَمْ يَكُ نُطْفَةً مِّن مَّنِيٍّ يُمْنَىٰ

"Then did he become a clinging clot; then did (Allah) make and fashion (him) in due proportion.

ثُمَّ كَانَ عَلَقَةً فَخَلَقَ فَسَوَّىٰ

"And of him He made two sexes, male and female."

فَجَعَلَ مِنْهُ الزَّوْجَيْنِ الذَّكَرَ وَالْأُنثَىٰ

[Al-Qur'an 75:37-39]

Here again it is mentioned that a small quantity (drop) of sperm (indicated by the word *nutfatan min maniyyin*) which comes from the man is responsible for the sex of the foetus.

Mothers-in-law in the Indian subcontinent, usually prefer having male grandchildren and often blame their daughters-in-law if the child is not a boy. If only they knew that the determining factor is the nature of the male sperm and not the female ovum! If they were to blame anybody, they should rather blame their sons, not their daughters-in-law, since both the Qur'an and Science hold that it is the male fluid that is responsible for the sex of the child!

FOETUS PROTECTED BY THREE VEILS OF DARKNESS

"He makes you, in the wombs of your mothers,	يَخْلُقُكُمْ فِى بُطُونِ أُمَّهَٰتِكُمْ
in stages, one after another,	خَلْقًا مِّنۢ بَعْدِ خَلْقٍ
in three veils of darkness." ***[Al-Qur'an 39:6]***	فِى ظُلُمَٰتٍ ثَلَٰثٍ ۚ

According to Prof. Keith Moore, these three veils of darkness in the Qur'an refer to:

(i) anterior abdominal wall of the mother
(ii) the uterine wall
(iii) the amnio-chorionic membrane.

EMBRYOLOGICAL STAGES

"Man We did create from a quintessence (of clay);	وَلَقَدْ خَلَقْنَا ٱلْإِنسَٰنَ مِن سُلَٰلَةٍ مِّن طِينٍ ۝
then We placed him as (a drop of) sperm	ثُمَّ جَعَلْنَٰهُ نُطْفَةً
in a place of rest, firmly fixed;	فِى قَرَارٍ مَّكِينٍ ۝
then We made the sperm into a clot of congealed blood;	ثُمَّ خَلَقْنَا ٱلنُّطْفَةَ عَلَقَةً
then of that clot We made a (foetus) lump;	فَخَلَقْنَا ٱلْعَلَقَةَ مُضْغَةً

then We made out of that lump bones and clothed the bones with flesh;	فَخَلَقْنَا الْمُضْغَةَ عِظٰمًا فَكَسَوْنَا الْعِظٰمَ لَحْمًا ۤ
then We developed out of it another creature.	ثُمَّ اَنْشَاْنٰهُ خَلْقًا اٰخَرَ ؕ
so blessed be Allah, the Best to create!"	فَتَبٰرَكَ اللّٰهُ اَحْسَنُ الْخٰلِقِيْنَ ؕ

[Al-Qur' an 23:12-14]

In this verse Allah states that man is created from a small quantity of liquid which is placed in a place of rest, firmly fixed (well established or lodged) for which the Arabic word *qaraarin makeen* is used. The uterus is well protected from the posterior by the spinal column supported firmly by the back muscles. The embryo is further protected by the amniotic sac containing the amniotic fluid. Thus the foetus has a well protected dwelling place.

This small quantity of fluid is made into *alaqah*, meaning something which clings. It also means a leech-like substance. Both descriptions are scientifically acceptable as in the very early stages the foetus clings to the wall and also appears to resemble the leech in shape. It also behaves like a leech (blood sucker) and acquires its blood supply from the mother through the placenta.

The third meaning of the word *alaqah* is a blood clot. During this *alaqah* stage, which spans the third and fourth week of pregnancy, the blood clots within closed vessels. Hence the embryo acquires the appearance of a blood clot in addition to

acquiring the appearance of a leech. Compare the readily available Qur'anic knowledge with Man's struggle with scientific findings:

In 1677, Hamm and Leeuwenhoek were the first scientists to observe human sperm cells (spermatozoa) through a microscope. They thought that a sperm cell contained a miniature human being which grew in the uterus to form a newborn. This was known as the perforation theory. When scientists discovered that the ovum was bigger than the sperm, it was thought by scientists like De Graf and others that the foetus existed in a miniature form in the ovum. Later, in the 18th century, Maupertuis propagated the theory of biparental inheritance.

The *alaqah* is transformed into *mudghah* which means 'something that is chewed (having teeth marks)' and also something that is tacky and small which can be put in the mouth like gum. Both these explanations are scientifically correct. Prof. Keith Moore took a piece of plaster seal and made it into the size and shape of the early stage of foetus and chewed it between the teeth to make it into a *mudghah*. He compared this with the photographs of the early stage of foetus. The teeth marks resembled the 'somites' which is the early formation of the spinal column.

This *mudghah* is transformed into bones (*izâm*). The bones are clothed with intact flesh or muscles (*lahm*). Then Allah makes it into another creature.

Prof. Marshall Johnson who is one of the leading scientists in the USA, and is the head of the Department of Anatomy and Director of the Daniel Institute at the Thomas Jefferson University in Philadelphia in the USA, was asked to comment on the verses of the Qur'an dealing with embryology. At first he said that the verses of the Qur'an describing the embryological stages cannot be a coincidence. It was probable that Muhammad (pbuh) had a powerful microscope. On being reminded that the Qur'an was revealed 1400 years ago, and microscopes were invented many centuries after the time of Prophet Muhammad (pbuh), Prof. Johnson laughed and admitted that the first microscope invented could not magnify more than 10 times and could not show a clear picture.

Later he said: "I see nothing here in conflict with the concept that Divine intervention was involved when Muhammad (pbuh) recited the Qur'an."[1]

According to Dr. Keith Moore, the modern classification of embryonic development stages which is adopted throughout the world, is not easily comprehensible, since it identifies stages on a numerical basis i.e. stage 1, stage 2, etc. On the other hand, the divisions revealed in the Qur'an are based on distinct and easily identifiable forms or shapes, which the embryo passes through. These are based on different phases of pre-natal development

[1] The reference for this statment is the video tape titled '*This is the Truth*'. For a copy of this video tape contact the Islamic Research Foundation.

and provide elegant scientific descriptions that are comprehensible and practical.

Embryological stages of human development have also been described in the following verses:

"Was he not a drop of sperm emitted (in lowly form)?

أَلَمْ يَكُ نُطْفَةً مِّن مَّنِيٍّ يُمْنَىٰ ۝

Then did he become a clinging clot; then did (Allah) make and fashion (him) in due proportion.

ثُمَّ كَانَ عَلَقَةً فَخَلَقَ فَسَوَّىٰ ۝

and of him He made two sexes, male and female."

فَجَعَلَ مِنْهُ الزَّوْجَيْنِ الذَّكَرَ وَالْأُنثَىٰ ۝

[Al-Qur'an 75:37-39]

"Him Who created thee, fashioned thee in due proportion, and gave thee a just bias;

الَّذِي خَلَقَكَ فَسَوَّاكَ فَعَدَلَكَ ۝

in whatever Form He wills, does He put thee together."

فِي أَيِّ صُورَةٍ مَّا شَاءَ رَكَّبَكَ ۝

[Al-Qur'an 82:7-8]

EMBRYO PARTLY FORMED AND PARTLY UNFORMED

At the *mudghah* stage, if an incision is made in the embryo and the internal organ is dissected, it will be seen that most of them are formed while the remaining are not yet completely formed.

According to Prof. Johnson, if we describe the embryo as a complete creation, then we are only describing that part which is already created. If we describe it as an incomplete creation, then we are only describing that part which is not yet created. So, is it a complete creation or an incomplete creation? There is no better description of this stage of embryogenesis than the Qur'anic description, "partly formed and partly unformed", as in the following verse:

"We created you out of dust,	خَلَقْنَٰكُم مِّن تُرَابٍ
then out of sperm,	ثُمَّ مِن نُّطْفَةٍ
then out of a leech-like clot,	ثُمَّ مِنْ عَلَقَةٍ
then out of a morsel of flesh,	ثُمَّ مِن مُّضْغَةٍ
partly formed and partly unformed	مُّخَلَّقَةٍ وَغَيْرِ مُخَلَّقَةٍ
that We may manifest (Our Power) to you."	لِّنُبَيِّنَ لَكُمْ

[Al-Qur'an 22:5]

Scientifically we know that at this early stage of development there are some cells which are differentiated and there are some cells that are undifferentiated – some organs are formed and yet others unformed.

SENSE OF HEARING AND SIGHT

The first sense to develop in a developing human embryo is hearing. The foetus can hear sounds after the 24th week. Subsequently, the sense of sight is developed and by the 28th week, the retina becomes sensitive to light.

The Qur'an explains it thus:

"And He gave you (the faculties of) hearing — وَجَعَلَ لَكُمُ السَّمْعَ

and sight and feeling (and understanding)." — وَالْأَبْصَارَ وَالْأَفْئِدَةَ

[Al-Qur'an 32:9]

"Verily We created man from a drop of mingled sperm, in order to try him: — إِنَّا خَلَقْنَا الْإِنسَانَ مِن نُّطْفَةٍ أَمْشَاجٍ نَّبْتَلِيهِ

so We gave him (the gifts), of Hearing and Sight." — فَجَعَلْنَاهُ سَمِيعًا بَصِيرًا

[Al-Qur'an 76:2]

"It is He Who has created for you (the faculties of) — وَهُوَ الَّذِي أَنشَأَ لَكُمُ

hearing, sight, feeling and understanding: السَّمْعَ وَالْأَبْصَارَ وَالْأَفْئِدَةَ

little thanks it is ye give!” قَلِيلًا مَّا تَشْكُرُونَ ○

[Al-Qur’an 23:78]

In all these verses the sense of hearing is mentioned before that of sight. Thus the Qur’anic description matches perfectly with the discoveries in modern embryology.

13. GENERAL SCIENCE

FINGERPRINTS

"Does man think that We cannot assemble his bones?

أَيَحْسَبُ الْإِنْسَانُ أَلَّنْ نَجْمَعَ عِظَامَهُ ۝

Nay, We are able to put together in perfect order the very tips of his fingers."

بَلَىٰ قَادِرِينَ عَلَىٰ أَنْ نُسَوِّيَ بَنَانَهُ ۝

[Al-Qur'an 75:3-4]

Unbelievers argue regarding resurrection taking place after bones of dead people have disintegrated in the earth and how each individual would be identified on the Day of Judgement. Almighty Allah answers that He can not only assemble our bones but can also reconstruct perfectly our very fingertips.

Why does the Qur'an, while speaking about determination of the identity of the individual, speak specifically about fingertips? In 1880, fingerprinting became the scientific method of identification, after research done by Sir Francis Golt. No two persons in the world can ever have exactly the same fingerprint pattern, not even identical twins. That is the reason why police forces worldwide use fingerprints to identify criminals.

Fourteen hundred years ago, who could have known the uniqueness of each human's fingerprint? Surely it could have been none other than the Creator Himself!

PAIN RECEPTORS IN THE SKIN

It was thought that the sense of feeling and pain was dependent only on the brain. Recent discoveries however prove that there are pain receptors present in the skin, without which a person would not be able to feel pain.

When a doctor examines a patient suffering from burn injuries, he verifies the degree of burns by a pinprick. If the patient feels pain, the doctor is happy, because it indicates that the burns are superficial and the pain receptors are intact. On the other hand, if the patient does not feel any pain, it indicates that it is a deep burn and the pain receptors have been destroyed.

The Qur'an gives a clear indication of the existence of pain receptors in the following verse:

"Those who reject our signs,	إِنَّ الَّذِينَ كَفَرُوا بِآيَاتِنَا
We shall soon cast into the Fire;	سَوْفَ نُصْلِيهِمْ نَارًا
as often as their skins are roasted through, We shall change them for fresh skins,	كُلَّمَا نَضِجَتْ جُلُودُهُم بَدَّلْنَاهُمْ جُلُودًا غَيْرَهَا
that they may taste the Penalty:	لِيَذُوقُوا الْعَذَابَ

for Allah is Exalted in Power, Wise." إِنَّ اللّٰهَ كَانَ عَزِيزًا حَكِيمًا

[Al-Qur'an 4:56]

Prof. Tagatat Tejasen, Chairman of the Department of Anatomy at Chiang Mai University in Thailand, has spent a great amount of time on research of pain receptors. Initially he could not believe that the Qur'an mentioned this scientific fact 1,400 years ago. He later verified the translation of this particular Qur'anic verse. Prof. Tejasen was so impressed by the scientific accuracy of the Qur'anic verse, that at the 8th Saudi Medical Conference held in Riyadh on the Scientific Signs of Qur'an and Sunnah, he proudly proclaimed in public:

لَآ إِلٰهَ إِلَّا اللّٰهُ مُحَمَّدٌ رَّسُولُ اللّٰهِ

"There is no God but Allah and
Muhammad (pbuh) is His Messenger."

14. CONCLUSION

To attribute the presence of scientific facts in the Qur'an to coincidence would be against common sense and a true scientific approach.

Indeed the scientific accuracy of the Qur'anic verses confirm the Qur'an's open declaration.

"Soon will We show them Our Signs in the (furthest) regions (of the earth), and in their own souls, until it becomes manifest to them that this is the Truth it is not enough that Thy Lord doth witness all things?"

سَنُرِيهِمْ آيَاتِنَا فِي الْآفَاقِ
وَفِي أَنفُسِهِمْ حَتَّىٰ يَتَبَيَّنَ
لَهُمْ أَنَّهُ الْحَقُّ ۗ أَوَلَمْ
يَكْفِ بِرَبِّكَ أَنَّهُ عَلَىٰ
كُلِّ شَيْءٍ شَهِيدٌ ۝

[Al-Qur'an 41:53]

The Qur'an invites all humans to reflect on the Creation of this universe in the verse:

"Behold! In the creation of the heavens and the earth,

إِنَّ فِي خَلْقِ السَّمَاوَاتِ
وَالْأَرْضِ

and the alternation of Night and Day –

وَاخْتِلَافِ اللَّيْلِ وَالنَّهَارِ

there are indeed Signs for men of understanding."

لَآيَاتٍ لِّأُولِي الْأَلْبَابِ

[Al-Qur'an 3:190]

The scientific evidences of the Qur'an clearly prove its Divine origin. No human could have produced a book, fourteen hundred years ago, that would contain such profound scientific facts.

The Qur'an, however, is not a book of Science but a book of 'Signs'. These signs invite Man to realize the purpose of his existence on earth, and to live in harmony with Nature. The Qur'an is truly a message from Allah, the Creator and Sustainer of the universe. It contains the same Message of the Oneness of God, that was preached by all prophets, right from Adam, Moses, Jesus to Muhammad (peace be upon them).

Several detailed tomes have been written on the subject of Qur'an and modern science and further research in this field is on. Inshallah, this research will help mankind to come closer to the Word of the Almighty. This booklet contains only a few of the scientific facts present in the Qur'an. I cannot claim to have done full justice to the subject.

Prof. Tejasen accepted Islam on the strength of just one scientific 'sign' mentioned in the Qu'ran. Some people may require ten signs while some may require hundred signs to be convinced about the Divine origin of the Qur'an. Some would be unwilling to accept the Truth even after being shown a thousand signs. The Qur'an condemns such a closed mentality in the verse:

صُمٌّۢ بُكۡمٌ عُمۡیٌ فَهُمۡ لَا یَرۡجِعُونَ ۝

"Deaf, dumb and blind,

They will not return
(To the path)."

[Al-Qur'an 2:18]

The Qur'an contains a complete code of life for the individual and society. Alhamdulillah (Praise be to Allah), the Qur'anic way of life is far superior to the 'isms' that modern man has invented out of sheer ignorance. Who can give better guidance than the Creator Himself?

I pray that this humble effort is accepted by Allah, to whom I pray for mercy and guidance (Aameen).